GRIP DC8
Microphysical Observations

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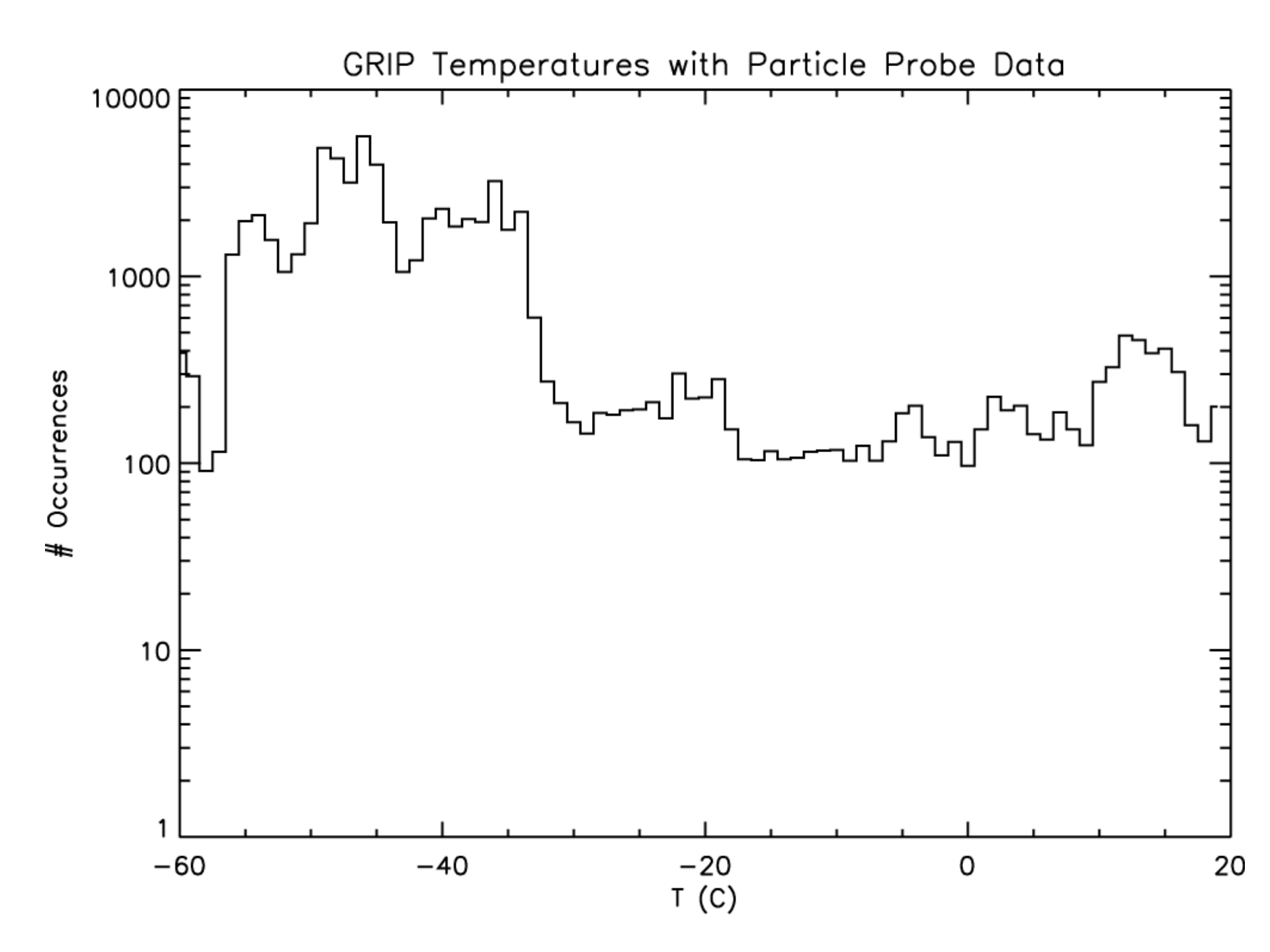
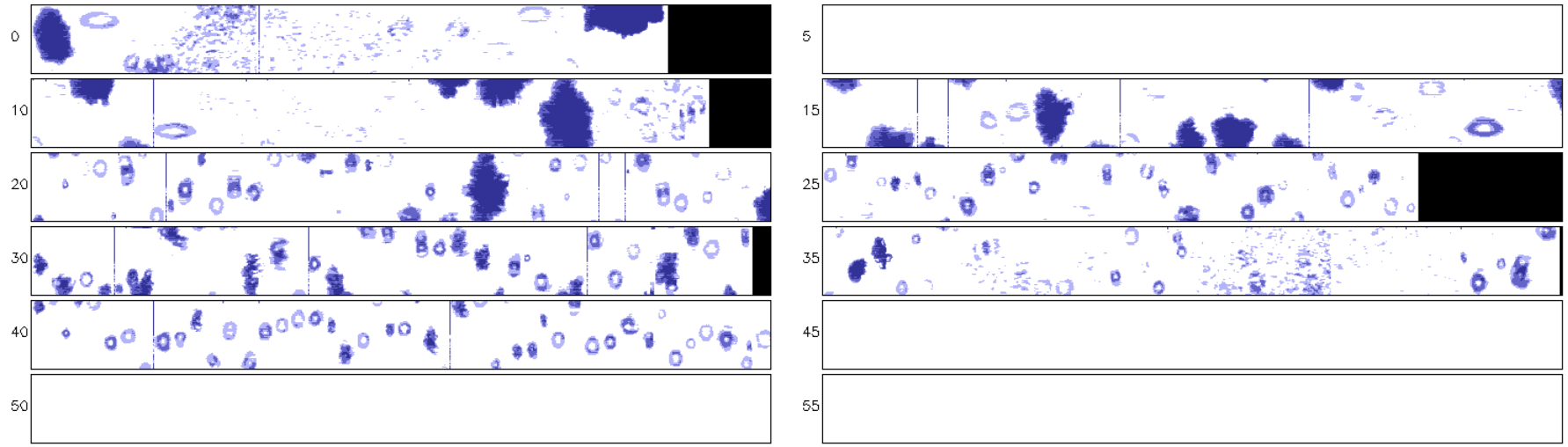
NCAR Microphysics Probes

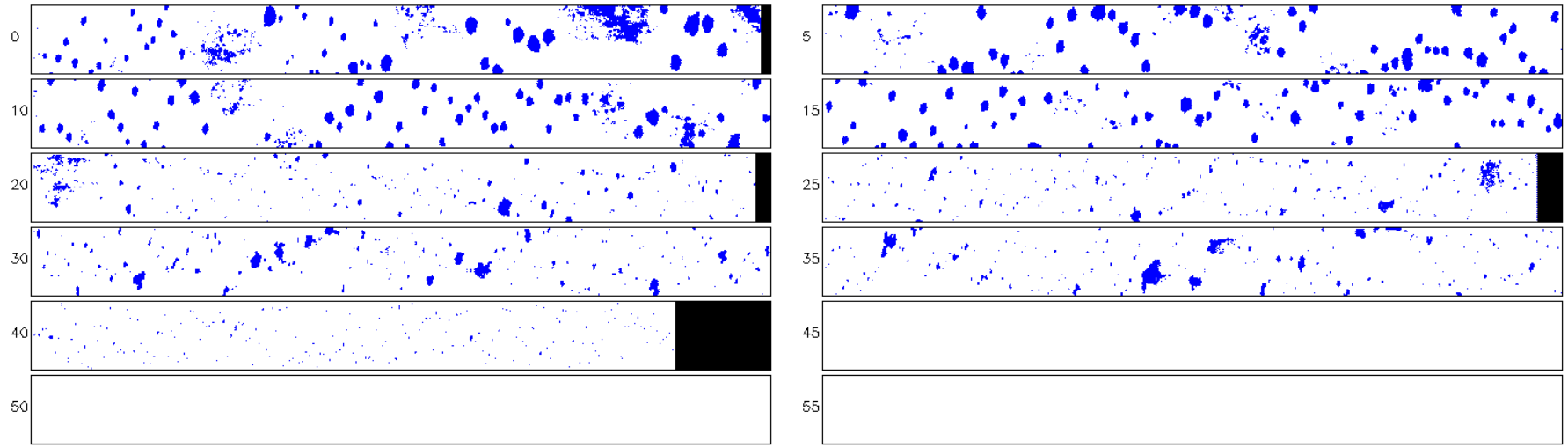
Instrument	Measurement	Range
Cloud Aerosol Spec.	Small Particles	0.6-50 microns
Cloud Droplet Probe	Small Particles	3-50 microns
Cloud Imaging Probe	Large Particles/2D shape	50-1500 microns
Precip. Imaging Probe	Large Particles/2D shape	100 microns-2.75 cm (*)
Rosemount Icing Probe	Supercooled Liquid Water	-1 to +5 Volts
Cloud Spec. and Counterflow Impactor	Small Particles, Condensed water content	0.6-50 microns 0.01-2 g/m3


GRIP Temperatures with Particle Probe Data
10000
1000
100
10
1
Occurrences
−60
−40
−20
0
20
T (C)

09022010 171800 Buffer width = 960 microns.
Project: GRIP Probe: CIPG Resolution: 15 microns
This image represents one minute of flight time.



09022010 171800 Buffer width = 6400 microns.
Project: GRIP Probe: PIP Resolution: 100 microns
This image represents one minute of flight time.



09022010 184700 Buffer width = 960 microns.
Project: GRIP Probe: CIPG Resolution: 15 microns
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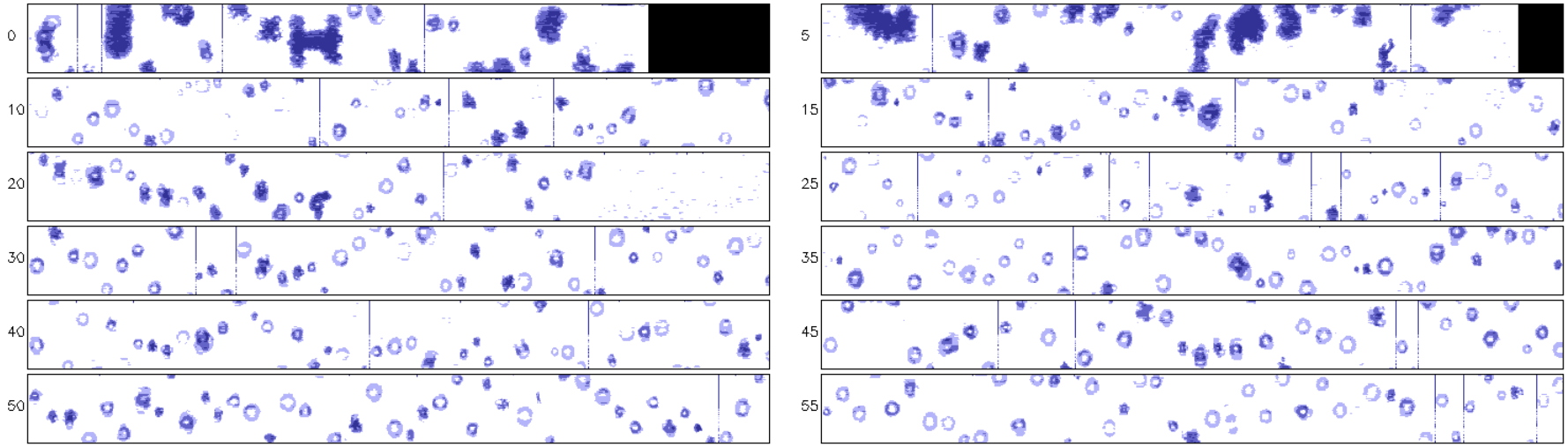
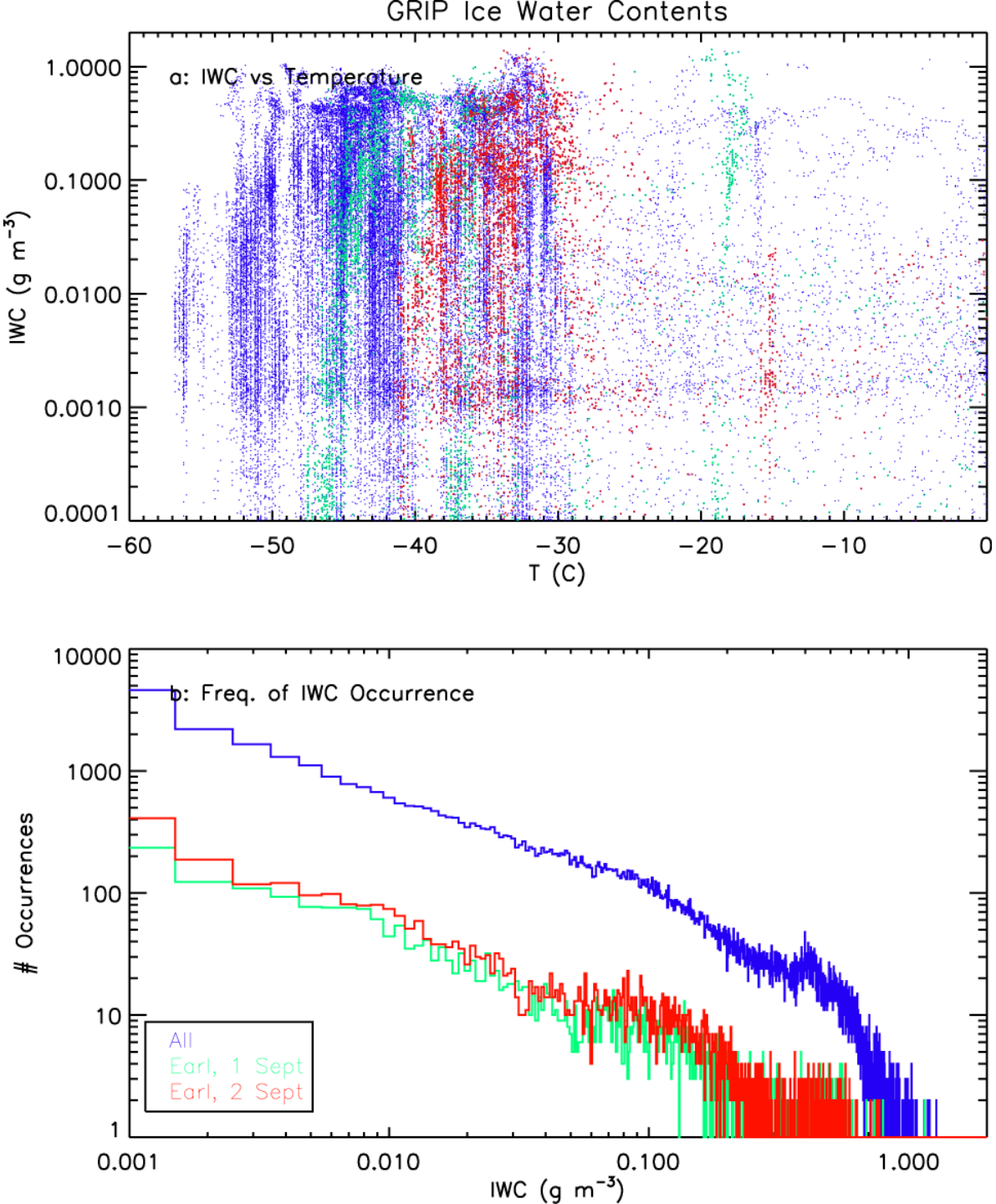
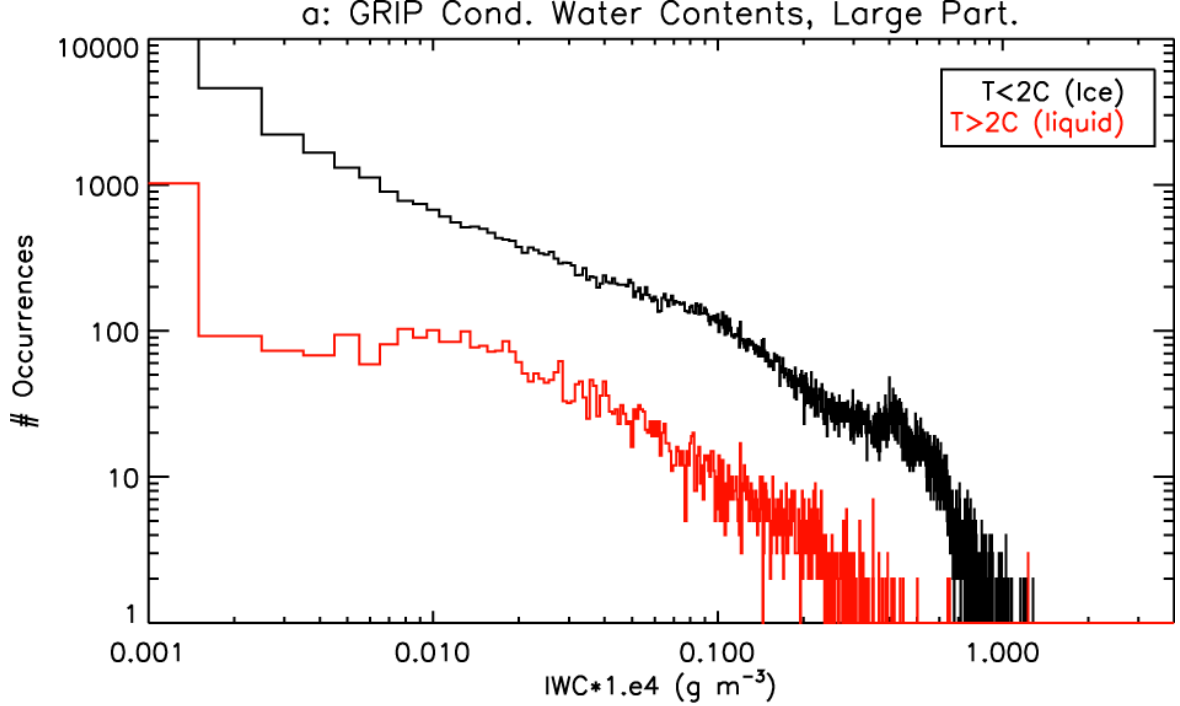
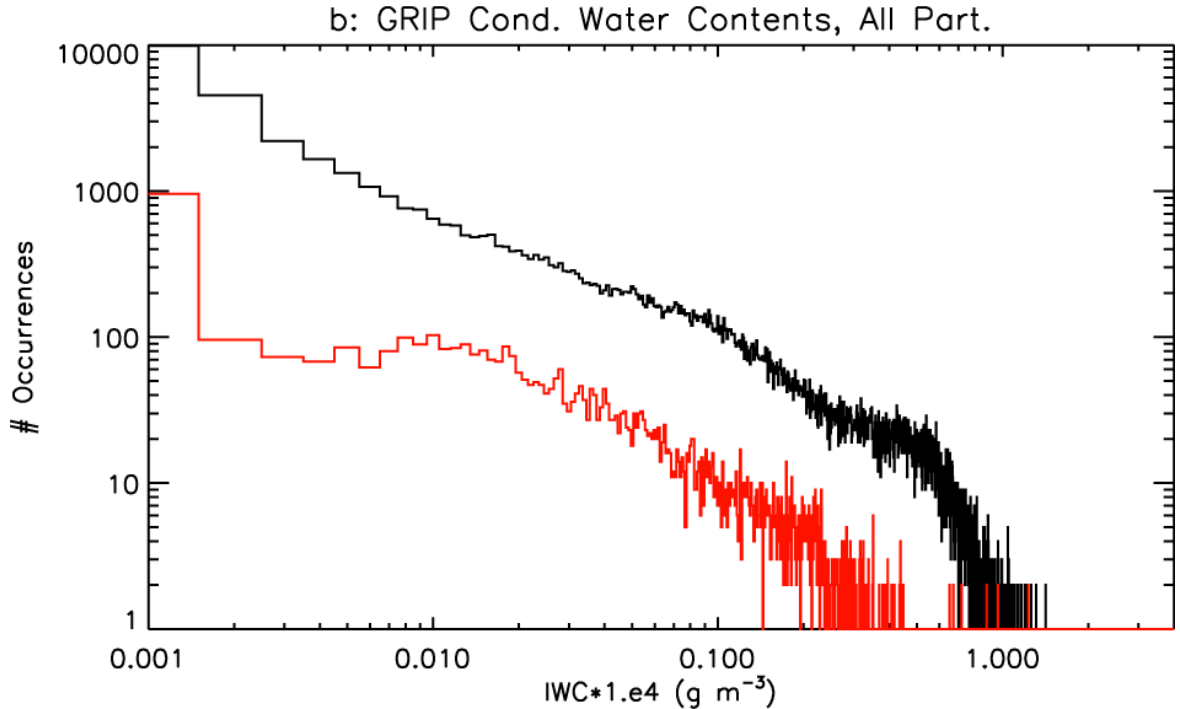
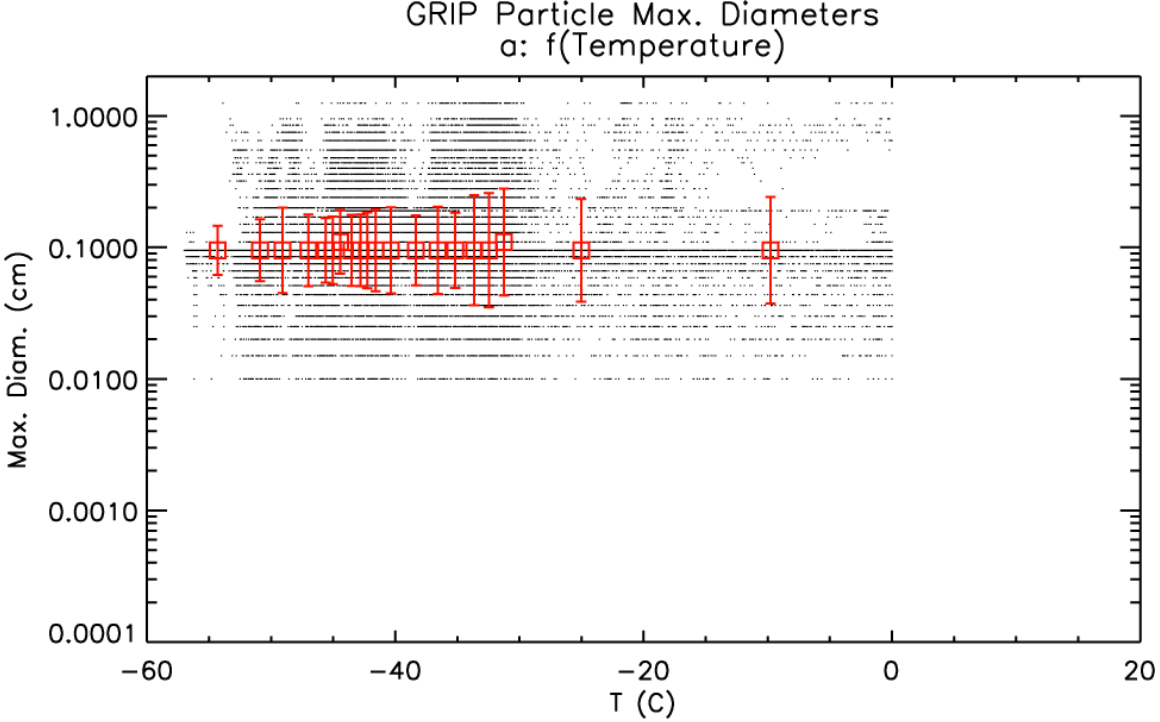
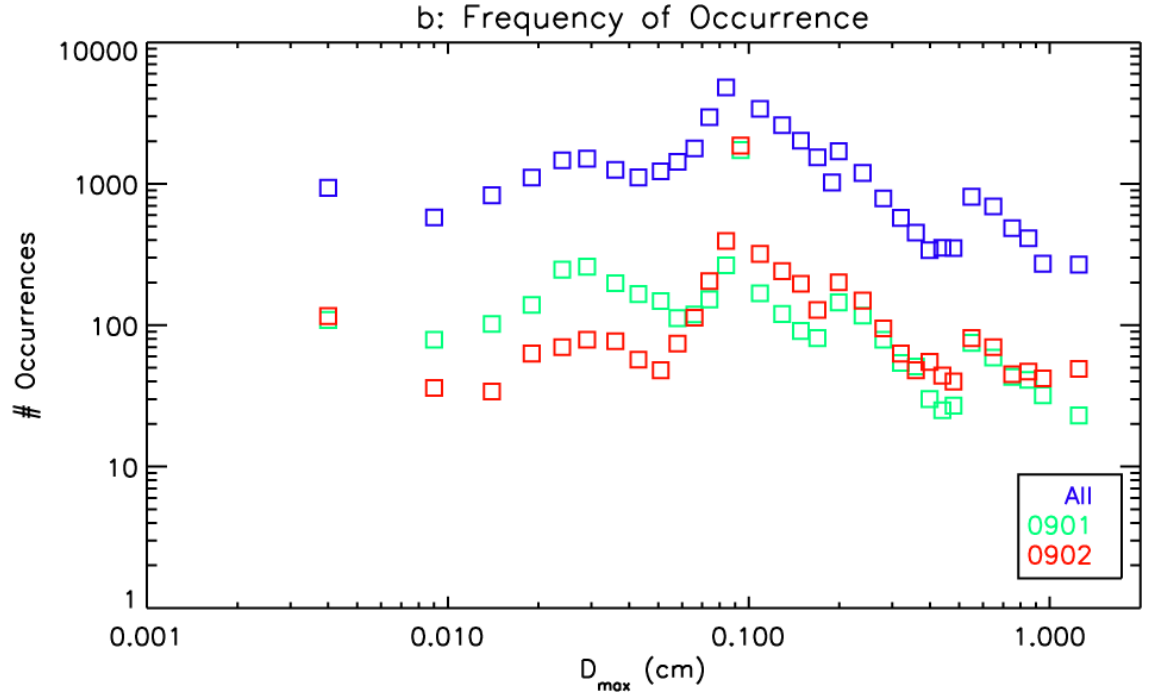


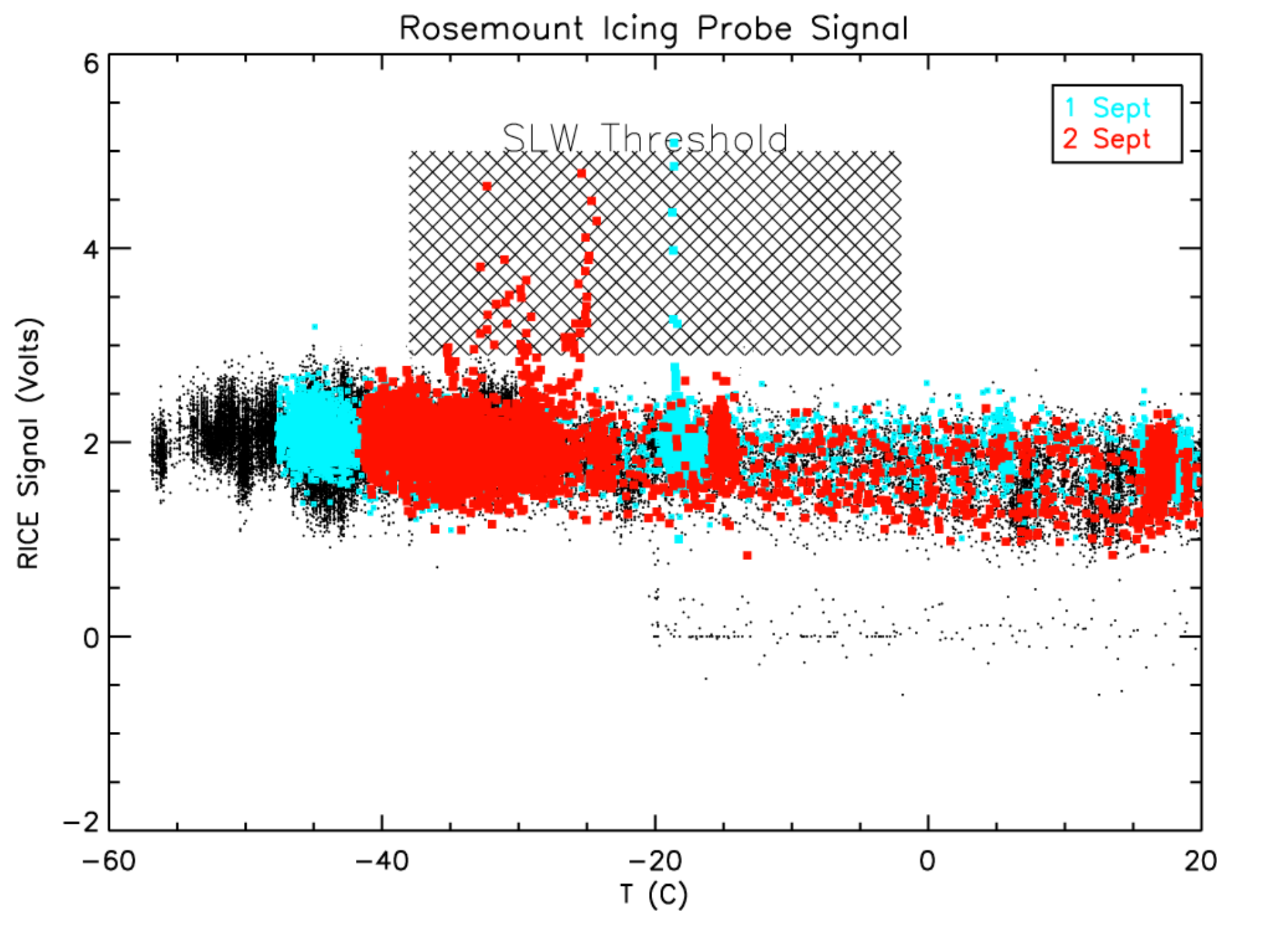

GRIP Ice Water Contents
a: IWC vs Temperature
IWC (g m^{-3})
1.0000
0.1000
0.0100
0.0010
0.0001
−60
−50
−40
−30
−20
−10
0
T (C)
b: Freq. of IWC Occurrence
Occurrences
10000
1000
100
10
1
All
Earl, 1 Sept
Earl, 2 Sept
0.001
0.010
0.100
1.000
IWC (g m^{-3})

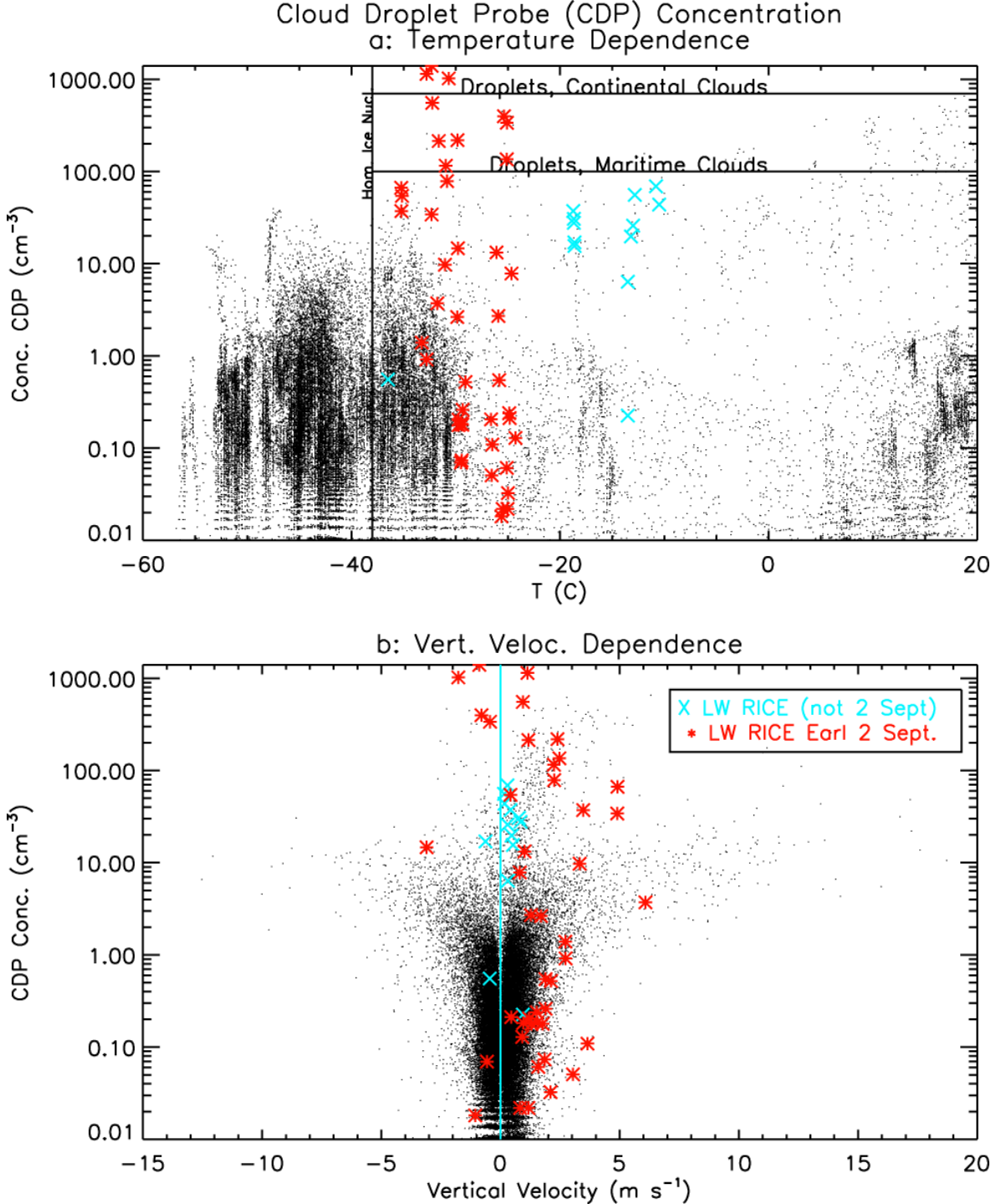

a: GRIP Cond. Water Contents, Large Part.
T<2C (Ice)
T>2C (liquid)
Occurrences
10000
1000
100
10
1
0.001
0.010
0.100
1.000
IWC*1.e4 (g m^{-3})

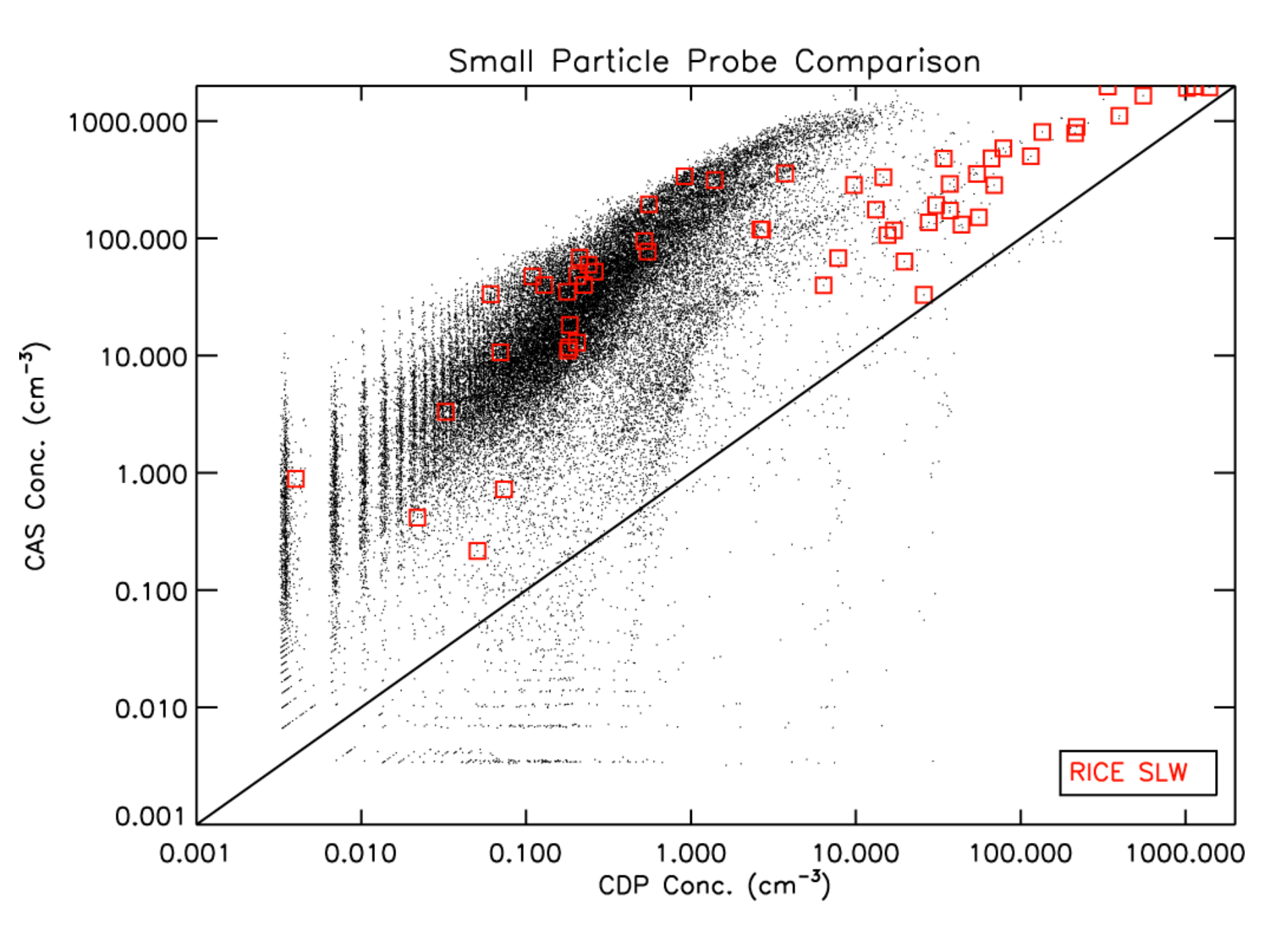

b: GRIP Cond. Water Contents, All Part.
Occurrences
10000
1000
100
10
1
0.001
0.010
0.100
1.000
IWC*1.e4 (g m^{-3})


GRIP Particle Max. Diameters
a: f(Temperature)
Max. Diam. (cm)
1.0000
0.1000
0.0100
0.0010
0.0001
−60
−40
−20
0
20
T (C)


b: Frequency of Occurrence
Occurrences
10000
1000
100
10
1
0.001
0.010
0.100
1.000
D max (cm)
All
0901
0902


Rosemount Icing Probe Signal
SLW Threshold
1 Sept
2 Sept
RICE Signal (Volts)
T (C)
6
4
2
0
−2
−60
−40
−20
0
20


Cloud Droplet Probe (CDP) Concentration
a: Temperature Dependence
Droplets, Continental Clouds
Droplets, Maritime Clouds
Hom. Ice Nucl.
Conc. CDP (cm^{-3})
1000.00
100.00
10.00
1.00
0.10
0.01
−60
−40
−20
0
20
T (C)
b: Vert. Veloc. Dependence
X LW RICE (not 2 Sept)
* LW RICE Earl 2 Sept.
CDP Conc. (cm^{-3})
1000.00
100.00
10.00
1.00
0.10
0.01
−15
−10
−5
0
5
10
15
20
Vertical Velocity (m s^{-1})


Small Particle Probe Comparison
1000.000
100.000
10.000
1.000
0.100
0.010
0.001
CAS Conc. (cm⁻³)
0.001
0.010
0.100
1.000
10.000
100.000
1000.000
CDP Conc. (cm⁻³)
RICE SLW

Summary and Conclusions

- Excellent, reliable data set (CDP, RICE)
- Data Archived at ftp://ftp.ucar.edu/pub/mmm/bansemer/grip/
- Also, on the GRIP website
- We seek collaboration with other GRIP investigators